

MASTIN (C.H.)

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INTERNAL URETHROTOMY

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AS A CURE FOR

URETHRAL STRICTURE.

BY

*Presented by
the Author*

C. H. MASTIN, M. D.,

MOBILE.

WRITTEN BY REQUEST,

FOR THE

MEDICAL ASSOCIATION OF ALABAMA,

SESSION OF 1871.

"Je prends le bien ou je le trouve."

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1871.

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URETHRAL STRICTURE

BY
C. E. MARTIN, M. D.
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FOR THE

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It is hereby recommended that the following be printed:

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1911

CORRESPONDENCE.

MEDICAL ASSOCIATION OF THE STATE OF ALABAMA, }
OFFICE OF THE PRESIDENT, }
MOBILE, April 9, 1870. }

DR. C. H. MASTIN :

DEAR SIR—You are hereby appointed, and *respectfully requested* to report at the next annual meeting of the Alabama State Medical Association, on "*Internal Urethrotomy*."

Very respectfully, your ob'tserv't.,

F. A. ROSS, M. D.,

President Ala. S. M. A.

MOBILE, June 17, 1871.

DR. C. H. MASTIN :

DEAR SIR—At a meeting of the Publishing Committee of the Medical Association of the State of Alabama, held on yesterday evening, it was decided not to publish your paper on Internal Urethrotomy, in the Volume of Transactions for the present year, but to leave it to be decided by the Association at its next meeting, whether it shall be published or not. The ground upon which the Publishing Committee decline to order the publication of your paper, is that you are not a member of the Association, and that it is not right to tax those who sustain the Association to publish the productions of persons not connected with it. I am sorry if anything which I may have said has led you to incur expense in the preparation of plates for the illustration of your paper, or has in any other way caused you to take any trouble which this action of the Publishing Committee renders useless.

I have the honor to remain,

Your ob'tserv't.,

JEROME COCHRAN, M. D.,

Secretary M. A. S. A.

MOBILE, ALA., June 19, 1871.

DR. JEROME COCHRAN, Sec'y Med. Ass'n State of Alabama :

SIR—Your communication of the 17th instant, in which you inform me of the action of the Publishing Committee of the Medical Association of the State

of Alabama, is at hand. In reply, I beg to enclose you for their advisement a copy of the invitation and request of your President, that I should prepare the paper in question.

This invitation was extended to me without my knowledge or solicitation. As a proper acknowledgment of the courtesy, I accepted and prepared the article.

I was present when the reports were called for, in the order in which they had been published in the Transactions of the session of 1870. But owing to the discussion upon the "Free School System," so much time had been consumed, that when my article was called for, I stated to the Association I feared it would weary their patience, as it was quite long, and would necessarily consume much time to read it. Upon this ground several reports, and mine among the number, were passed, as I understood it, with the vote of the Association that they be published.

Having been strongly solicited by several of the most prominent members of the Association, I, with reluctance, gained my own consent to furnish it for publication in the Transactions. Yet, even to this date, you are aware that a copy of the same *has not* been furnished to the Committee. Their action, I am pleased to state, has relieved me of the embarrassment under which I have been laboring, for I can assure you it has not been my wish they should be "*taxed to publish*" any of my productions.

And, in conclusion, permit me to hope that you will not feel that you have been the cause of any expense on my part in the preparation of plates or illustrations for the article prepared.

I have the honor to be

Your ob't serv't,

C. H. MASTIN, M. D.

PREFACE.

The publication of this article in pamphlet form necessitates an explanation. It was written, as the foregoing correspondence will show, to be read at the last session of "The Medical Association of the State of Alabama," which was held at Mobile, in March, 1871.

Its object was to show the present state to which "Internal Urethrotomy" had been brought, with an abridged history of the operation—not for the purpose of advocating any special course of treatment of Urethral Stricture; for we do not propose to confine the treatment of this affection to any one special mode, knowing, as we do, that stricture in its different states requires as many varied methods of interference for its cure. But it was to acknowledge the courtesy which had been extended to me by the President of the State Association. Not being a member of that body, I felt it incumbent upon myself to respond to the invitation, by preparing the paper upon the subject designated.

Unfortunately for the peace and harmony of the session, much time was consumed in a debate which [arose upon the "Free System of Lectures," as adopted by the Alabama Medical College—to which system it was well known my convictions were opposed—and very little time remained before adjournment for the reading of papers, which had been prepared for the Association. When my paper was called for, in the order in which it had been recorded in the Transactions of 1870, I stated to the Association I was unwilling to consume its valuable time in the reading of a long article. It was then called for by several members that it be read in synopsis, as some desire had been expressed to hear the paper. I stated it was not possible to read it in that form, whereupon, if my memory and that of others serve me aright, the Association passed it for publication. Notwithstanding I was strongly urged by my friends to furnish the paper to the Publishing Committee, I was disinclined to do so, as the subject matter thereof is material to a publication still in view; and up to the time when the annexed note from the Committee was received. I still held the matter in abeyance, and to that date no copy had ever been furnished them, nor had they ever read a line thereof.

Perfectly aware that there is very little which is new or interesting in the

isolated subject, "Internal Urethrotomy," I, nevertheless, yield to the wishes of personal friends, and furnish it in this form.

I take this opportunity of acknowledging my indebtedness to that accomplished maker of surgical instruments, Mr. F. Stohlmann, of the house of Tiemann & Co., New York, for his kindness in furnishing the Electrotypes used in the text.

*No. 74 Conti street,
Mobile, November, 1871.*

Report on Internal Urethrotomy.

Mr. President and Gentlemen of the

State Medical Association :

In response to the invitation extended me, to read a paper upon "Internal Urethrotomy," at this session, I accept the task, more in a spirit of compliance, and as a proper acknowledgment of the honor conferred upon me, than with the hope that I shall be enabled to interest your attention, or offer any new material for your advisement.

Within the past few years, so much has been written on this subject, and so many new and vexed ideas have been advanced, and in many instances well sustained, that very little seems to remain for me beyond a review of the subject, from its early history to its present perfected condition. As briefly as possible I shall run over the subject which has been selected for me, and endeavor to give you the main essential points in relation to this branch of special surgery, indulging in the hope that you will bear with the tedium of a prolix style, and in your generosity draw the veil of charity over the many imperfections with which it will abound.

William and John Hunter, two surgeons, whose names have been made illustrious by the benefits which they conferred upon the human race, introduced into Pathology that clear and inductive reasoning which had characterized their physiological speculations, thereby calling forth a system of enlightened principles which has thoroughly humanized every branch of the healing art. They taught that Nature was the only safe instructress in pathology and therapeutics, and that it was only by a careful and patient investigation of her laws, in health and in disease, that we were to arrive at a reliable basis upon which to build a suc-

cessful practice. From the school which these two medical philosophers had created, there went forth many distinguished disciples who, by their writings, lectures, and examples, spread the Hunterian system wide over the world.

‘The spark having been struck in the British Isles, it was not long before the investigating mind of Germany was awakened, and France, experimental in her researches, acknowledged the important truths. ‘As a result, a careful interpretation of Nature became the rigidly enforced rule.’ Medicine, Obstetrics, and Surgery were marshaled under the Hunterian line of principles; all rash, interfering, or rude methods of treatment were abandoned. The *Vis Medicatrix Naturæ* became the watchword, and *Arte non vi* the reply.

‘To this continued subjection of the mind to the careful contemplation of natural causes and effects, we owe the marked improvement which of late years has taken place in every department of our profession. But unfortunately it is a weakness of the human mind to oscillate from one extreme to the other, and so it is we see in the practice of medicine within a very few years past, the practical pendulum has vibrated from the heroic doses of mercury, and the lancet, to the infinitesimal nothings of homœopathic globules, or the folly of a supinely expectant treatment.

‘In midwifery, where one has been led astray, by excessive instrumentation, another has fallen into a helpless acquiescence in avoidable evils, whilst in surgery, where the young and inexperienced have run wild over the glare and brilliancy of a finely executed operation, with but little care or reflection for the true interests of the patient, another class, with an affected aversion to the knife, have been seduced into a fatal procrastination; and thus it is we see “the native hue of resolution” nowhere more “sicklied o’er” than in some of the obstinate forms of urethral stricture.

‘How unfortunate it has been for this class of cases that the teachings of that great light of English surgery, Mr. Abernethy, who denounced all violence in catheterism as inconsistent with the main purpose of the remedy, viz: the absorption of the “*materies morbi*,” composing the stricture, should have had a greater effect than he contemplated. A timid, dilatory treatment has been the result, and in too many instances the passive interference of the surgeon has permitted the case to drift on to a fatal termination, thus revealing the melancholy truth—Nature will not, Nature cannot cure organic stricture.’

Recognizing this truism, various methods have been adopted in the treatment of this grave affection; but not being in the scope of the present article for me to write a didactic treatise on urethral stricture, I shall, as a prelude only, refer to the different

methods which have been resorted to, prior to the introduction of the more important operation now under consideration, namely, "Internal Urethrotomy," or the section of the stricture within the urethra. In referring to the early history of urethral surgery, we find three methods have been in general use for the cure of urethral coarctations.

1st—Dilatation ;

2nd—Canterization ;

3d—Incision ;

(The latter being either internal or external.)

Of these the first, or dilatation has, from the remotest period, been most generally—and I may say universally—resorted to ; hence, in the long lapse of time it is not to be wondered at that it has been modified, divided, and subdivided into many forms, and being the mildest, so it must be considered the most desirable course of treatment to be employed, whenever the case is such as will admit of a cure by its adoption. Its various modifications all depend upon the use in one form or another of the Sound or Bougie, and in this connection it may not prove wholly uninteresting, to trace briefly the history of the different instruments with which dilatation has been employed for the cure of stricture.

The earliest reliable treatise which has fallen under my observation, is a report made to the Academy of Sciences by Baron Percy, on the 22d of October, 1807, A. D., in which he was pleased to trace the history of the fabrication and use of sounds and bougies. He refers in this report to a little volume published by Alphonso Ferri, in 1550, A. D., in which it is mentioned that Lacuna, years before this date, had acquired not only much honor, but had amassed great riches by having cured one of the Popes and several of the cardinals of Rome of obstinate strictures of the urethra, by the employment of bougies which were made by this Alphonso Ferri.

Contemporaneously with him, Christophe de Vega de Salamanque, by the skill with which he used these instruments, and the dexterity of his manipulations, had acquired so much reputation that patients crowded to him from all directions and poured into his coffers such countless treasures that it was facetiously said of him, "*Qu'il faisait pisser de l'or ses à malades,*" thus proving the trite old adage, so well understood, and fully to be appreciated by this unfortunate class of sufferers, "*Qu'est l'univers entier à l'homme que ne pert uriner.*"

Later, we find Jean le Français has established in Italy a factory for the fabrication of bougies, and so great was his success, and so universal their use, that he acquired the surname of *Jean des Bougies*. The composition of his instruments was carefully concealed, and the factory rigorously guarded. Yet, in the

course of time, he was induced to sell the secret to Charles IX, but no one ever having, by his instructions, been successful in fabricating an instrument of like value of those made by him, it has been suggested that Jean did not sell the true formula, and his secret is believed to have died with him. After this date, we find various substances being resorted to in the manufacture of these instruments, many of which were secret formulas, and most of them, like that of Jean, held as such; but in general use, like those of the present day, the most universal were wax, cat-gut, leather, and lead. As the subject became more investigated, and surgery more fixed in its principles, it was seen that these materials within themselves, were not universally to be relied upon in overcoming the "caruncles and carnosities" which the old surgeons believed to be the nature of strictures; among them Alphonso Ferri, Amatus Lusitanus, Andrea Lacuna, Phillipus, Christophe de Vega, and Francisco Diaz, began to call to their aid other methods than simple dilatation. We find them now smearing their bougies with pomades and ointments composed of verdigris, butter of antimony, quick lime, arsenic, alum, vitriol, &c., either to eat away the morbid material, or hasten the absorption of the stricture; they had no fixed opinion as to the true pathological condition of the disease, and as a consequence their system was entirely experimental; dilatation failing to relieve organic contractions, they naturally sought some more powerful means as an adjunct to the bougie; chemical reagents were less dangerous in their opinion than the knife, and as a sequence they found their way into general use—aids to dilatation.

Far beyond the XVIth century we read of metallic catheters in use near two thousand years ago, as referred to by Celsus; and some of these instruments made of bronze or copper, used in the early part of the Christian era have, in recent years, been dug up from amid the ruins of Herculaneum and Pompeii, and are now to be seen in the *Muzeo Borbonico* at Naples. They come to us from the misty past, silent, yet eloquent monitors of the diseases once rife in these the buried cities of Campania; they tell us, with the proof, something of the age of Urethral Surgery. Three or four centuries later we find that bronze and copper have given place to silver, and thence on to the present day, it seems to have remained the favorite metal; although we have evidence that horn and leather were much used in the fabrication of these instruments. Paulus Ægenitæ, who wrote in the VIIth century, referring to the Arabian surgeons, states "they used silver catheters," thus proving the very great antiquity of the instrument, and the preference for silver as the metal best adapted for its fabrication. In our day, we use the wax, gum or metal instrument, according to our fancy, or the special end in view, whether it be *Permanent, Continuous, Rapid* or *Vital* dilatation;

all of which methods have had their partisans, and each in its turn received modifications and changes from the gentle introduction of a soft instrument, gradually increased in size, at longer or shorter intervals; or, the progressive method with the sixty numbers of the Benignè Scale, by which the maximum degree of dilatation can be reached by a flexible metal sound in as many days, to the more violent procedure of Mayo, who, with six steel sounds, rapidly increasing in size distends the urethra by force. These various modifications by which dilatation is effected, have given rise to many kinds of rapid distention of urethral coarctations, comprised from first to last, in the 'Hydraulic Method' of Mr. Arnott—the forced injection of oil, as advocated and used by Soemmering, Despiney, Citadini, and Amussat—more recently the sliding tubes of Wakely, the expansion or *divulsion* of Perrève, modified by Barnard Holt, and styled by him his "*immediate treatment by rupture*," or the gentler plan of 'over distension,' used by Dr. Richardson, of Dublin—but more especially by Sir Henry Thompson, of London—have each and all had their admirers. In this very fact the greatest proof exists, if such is wanted, that the process of dilatation, whether simple or modified, is not an universal or complete remedy for stricture; for it is notoriously true that the highest authorities have been constantly at work upon new methods and complicated machines to supply its deficiencies. Even the ancient surgeons, failing in their treatment with the bougie, we discover them seeking "aids to dilatation." Alfonso Ferri, Lusitanus, and Lacuna, as we have shown, had recourse to escarotics and caustics to eat away the caruncles and carnosities which obstructed the passage of the bougie destined to stretch open the narrow place, and thus cure the stricture. As far back as 1603, A. D., it is recorded that Jean Baptiste Loyseau of Bordeaux, cauterised the urethra of Henry IV. with savine ointment, successfully to the introduction of a bougie, by which the royal patient was cured, and Loyseau, with a munificent fee, created 'Surgeon in Ordinary' to his Majesty.*

Richard Wiseman, in the XVIIIth century, revolutionized the treatment of stricture with his bougie armed with caustic potash, and in the XVIIIth century, Dionis, in his "*Cours d'Operations de Chirurgie*," speaks of "desiccative liquors" applied to strictures to soften them, so that the probe would pass and keep open the passage until it 'cicatrise anew.' In the latter end of the same century, we observe the great Hunter calling attention to the use of escarotics as aids to dilatation; and Sir Everard Home, his pupil, going still further, made their use the rule, and simple dilatation the exception. Soon after this, Mr. Whateley intro-

*Previous to this date Mayenne, as will be shown, operated upon Henry with the knife. Failing in the operation, he received the censure of the Royal Society of Paris.

duced into more general use potasa fusa, and was followed in France by Ducamp, Lallemand, Segalès and Leroy de Étioilles ; but, like all new ideas, caustics have gradually lost their general favor, and at the present time it would be difficult to say which especial one is most in repute.

This abandonment, as it were, of once a favorite method, is almost a convincing proof of the fact that caustics within themselves will not cure urethral stricture. The probability is, the benefit which has been ascribed to them, depends more upon allaying, by their peculiar action upon the mucus membrane, the irritation existing in the urethra coincident with the retrocissement, thus enabling the bougie, or 'port caustique' itself, to do the work by the process of dilatation, than upon any especial virtue within themselves as curative agents. How often do we see a transitory contraction which will not permit the smallest instrument to pass, or the over-distended bladder to pour out its contents, yield to the gentle touch of the mildest caustic, and almost immediately afterwards admit a full sized sound ; here, certainly, no other action took place beyond allaying the irritable condition of the mucus membrane, and lessening the muscular tonicity of the urethra.

Following this, we find searchers after radical cures resorting to the knife, and the despairing sufferer submitting to all manner of painful and dangerous operations, both within and without the urethra—sometimes with one result, and again without any benefit ; so with it all, we have no positive assurance that strictures have ever been more particularly or permanently cured by one method than by another, and in no department of surgery has greater dogmatism prevailed ; perhaps in none is it more unwarrantable than to apply any single kind of treatment as the exclusively appropriate one. Every surgeon who possesses tact, patience, and judgment with a *requisite experience*, may undoubtedly treat successfully by his own favorite method, it matters not what it may be, the larger majority of cases which apply to him ; but his success should not lead him to suppose or try and force the world to believe the plan peculiar to himself the only true one. As a rule, the cure depends far more upon the skill and judgment of the surgeon in applying it, than upon the system selected, or the especial instrument employed. Hence it is we see the partisans of every rival method claim oftentimes most legitimately, triumphant success—each for his own favorite scheme, whilst others, less justifiably, appear intent only upon bringing to light the failures of others. The exhibition of selected cases proves nothing, as the very operation which may have been successful in the hands of one, may utterly fail in those of another, whilst on the other side he may have attained equally satisfactory results by an entirely different course of

treatment. Hence we draw the deduction—no one method will prove universally successful in every case, or all the varieties of this disease, which a large field of practice produces—for its nature is such, that against it for its cure, we cannot possess too many resorts, and we would be unwise to deny to ourselves the right to select, with discrimination, the one most appropriate for a special case, from the many remedies before us.

Although a partisan myself to the operation of "Internal Urethrotomy," simply because in my hands it has afforded me better results than any other, I am far from being disposed to decry the various methods which are preferred by others, and which may have afforded them equally satisfactory terminations. Still, I am, from a rather extended experience of my own, forced to believe, and I think prepared to prove, that a well performed "Internal Urethrotomy" will be more satisfactory to the surgeon, and more permanent in its results, than any other known method of treatment. In this opinion I am sustained by that of the first urethral surgeons of the present day.

In approaching this—the subject matter of this paper, viz: the treatment of urethral stricture with the knife—I do so with the knowledge that I am surrounded on either hand by dangers and difficulties, which can be appreciated only by those who have paid especial attention to a subject concerning which there has been, of late years, so much angry contention. In order that he may arrive at any degree of certainty regarding the treatment of stricture by incision, the inquirer must approach the investigation with a mind totally unprejudiced; he must not only investigate the facts which have been established and laid before the profession; but, above all, he must note the results of his own observation with care and accuracy; for unless he has had some experience of his own, with which to compare that of others, it will be a hopeless task to come to any rational conclusion himself, or presume to enlighten others. Bed-side observations generally prove more accurate teachers than the best prepared monographs!

As fortuitous circumstances within the past few years have thrown quite a goodly number of cases of this disease under my observation, and as a consequence caused me to bestow much attention upon it, it shall be my purpose in this paper—after having briefly adverted to the nature of stricture, its pathological state, and anatomical locality; with reference to the various methods and instruments by which "Internal Urethrotomy" has been performed, and now accepted by the profession—to give an abstract of my own experience, and describe the steps of the operation which has served the best purpose in my hands. I propose to enumerate the various methods of scarifying and incising strictures, and more especially to call attention to the class of cases in which incision appears to be most applicable. When we

come to investigate this subject, it is not surprising that this method should have been put into practice so early in the history of urethral surgery, for we notice in viewing the practice of the earliest writers upon this special subject, they experienced great difficulties in dilating strictures located in certain regions of the urethra. Even when aided by cauterization it oftentimes proved inadequate to the end in view; and as early as 1603, A. D., Mayerne, of France, had operated upon Henry IVth with the knife. Unfortunately for himself he failed in the operation, and was severely censured by the Faculty of Paris, who condemned the procedure in no measured terms; a practical illustration of the fact that success is essential to the establishment of all great principles. Yet, later, as the subject became more understood, and the operation more perfected, we find the Faculty of Paris in 1852, A. D., awarding the prize of 12,000 francs, instituted by Monsieur le Marquis d'Argenteuil, to be paid annually for the best method of treating urethral stricture, to M. Reybard—whose operation, as accepted by the commission appointed to investigate the same, consisted of the most fearful urethral sections known to the profession.

We have mentioned that early in the XVIth and XVIIth centuries, Diaz, de Vega, and Paré combined incisions with cauterizations. Chopart speaks of the operation when the stricture "is not too far down in the urethra;" and Allies, in his treatise on the Urethra, published A. D. 1655, describes an operation in which he cut a coarctation situated in the glans penis. But it is to an American surgeon in 1795, that we owe the credit of being the first man who performed a systematic operation by incision of a stricture located deep in the urethral canal.

Philip Syng Physic, the justly entitled "Father of Surgery in the Western Hemisphere," by his inventive genius, originated the instruments, and performed the operation, which, since it has been perfected, has proved of such signal benefit to the human race; and here it is but just to say, rude and imperfect as these instruments were, they are the type upon which the more delicate of modern manufacture have been modeled, being in all their varied forms, composed, in most instances, of simple cannulated sounds, with lancet-pointed trocars.

A quarter of a century later, in 1823, Mr. McGhie, of Dumfries, Scotland, brought to the notice of the Edinburgh Medical and Surgical Journal this operation, which he claimed as a procedure of his own; although there was a very slight difference in his instruments from those of Dr. Physic; being essentially the same as those invented by him in 1795.

In 1827 Mr. Stafford again brought up the subject, and favorably introduced it to the English Faculty. To him especially is due the prominent advance from this date onward, of "Internal

Urethrotomy." His concise treatise on stricture, published in 1833, attracted the notice of the inventive genius of France, and the attention of the profession generally became interested in the subject. The master minds of Civiale, Mercier, Leroy, Candmont, Maisonneuve, and Vullimere, were directed to this branch of urethral affections, and the result has been, numerous forms of urethratomes devised, and the operation in a great measure perfected, so that it is no longer an addenda to the treatment by dilatation; but an operation *per se* to which dilatation has become, as it were, accessory. Having given an outline of the history of this operation, after a reference to the pathology, and the most usual location of urethral stricture, I will at once proceed to the different methods—at present adopted—and then try and illustrate, by a few cases, the steps of the operation preferred by myself, and show its success as attending those cases which have fallen under my care.

"What is a stricture?" This may be defined as an abnormal organic contraction of some portion of the urethral canal, which contraction may be regarded as Permanent or Transitory, in reference to its character of duration.

'Permanent Contractions' are due to organic deposits, in or around the walls of the urethra, which have no tendency to disappear by any natural action or function of the body, hence they have been designated as '*Organic and Permanent Strictures.*'

'Transitory Contractions' are dependent either upon local vacular inflammation or congestion, causing a temporary narrowing of some part of the canal, giving rise to the term '*Inflammatory or Congestive Stricture,*' or by causing an increased muscular action of the voluntary or involuntary fibres surrounding the urethra, thus producing what is known as '*Spasmodic Stricture.*'*

But as permanent contractions are the only kind which call for the use of the knife, we shall pass over those denominated Transitory, and at the same time avoid the necessity of entering into a classification of strictures; still, it will be necessary for our purpose, to notice generally the varieties of form which they assume, and which, for convenience, have been called '*Linear, Annular, Indurated Annular, and Irregular or Tortuous.*'

The Linear is the same stricture as that form which has been described by Sir Charles Bell, as the "Bridle Stricture," and so generally spoken of by urethral writers. Linear strictures are those which obstruct the canal by a thin membranous diaphragm, stretched across it, having somewhat the appearance of the pyloric orifice in its reference to the stomach and duodenum with the difference, the opening may be central, or at one or the other sides of the same; the presence of this membranous septum,

*Thompson, Sir Henry.

whether it be oblique in its passage or crescentic in shape, obstructing a segment only of the calibre of the canal, or entirely closing the passage, it matters not which—constitutes that form which is known by the term '*Linear Stricture*.'

Those varieties in which the contracted part is a little thicker and broader than the others, and such as give the appearance as if a band or cord was tied around a part or the whole of the calibre of the urethra, are known as '*Annular Strictures*.'

In some cases of confirmed stricture, we observe the induration extends into the tissues around the urethra to the depth of a half to one line. Although it may be limited in extent, upon the surface from before backward, it will be found that the central portion is denser and firmer in consistence, and consequently more contracted: giving, as it were, the appearance of an hour-glass to the coarctation. Most generally the induration is denser at the floor than in the upper segment of the urethra, a fact well worthy to be remembered, as on this account we generally make our incisions directly downward in all operations required for this form of contraction. This we recognize as the Indurated Annular, which probably is one of the most usual contractions we are called upon to relieve by an operation.

But perhaps the most trying cases which present themselves, is that variety known as the '*Irregular or Tortuous*,' in which the natural rugae of the urethra seem to have become adhesive and blended together by a sort of fusion, which may extend, in the course of the canal, from a few lines, sometimes to several inches, in which instances the induration extends deep into the sub-mucous or basement membrane: ever involving the entire substance of the corpus spongiosum, giving rise to the most obstinate of all the various forms of stricture, and against which no operation has proved of much avail, save one of the urethral sections, either external or internal.

The elements which enter into the pathological state, constituting stricture, are important, because we are unable to treat any disease upon scientific principles, unless we fully appreciate its true nature. Investigating this, we find the first effect of inflammation upon mucous membranes to be a swelling or thickening, caused by the engorgement of its vessels. Secondly, we see the exudation of an albuminous fluid taking place in the membrane itself, or more especially just below, in the tissue underlying, which may, under some favorable circumstances, become absorbed; but when this morbid action continues for a longer time, plastic material begins to be thrown out, which in time forms an organized fibrous tissue around the canal, binding together the mucous membrane and the sub-mucous layer, infiltrating itself into the meshes of the latter, and not infrequently involving the corpus spongiosum itself.

This dense formation, peculiar to itself, is that substance which nature throws out for the reparation of injuries. We see it in cicatrices after wounds—and those firm contractile bands, the result of burns—it is that substance which we know and understand as the "*Tissue Inondulaire*," "*Tissue Cicatriciel*," or as it has been more properly denominated by Jules Guérin, "*The Tissue Retractable*." By adopting this appellation its effects will be more fully explained, for wherever this substance takes place, we necessarily have more or less retraction, and as a consequence, whenever around cavities, the result must be retraction or a coarctation of the calibre of the cavity or the canal.

Such, in a very few words, is the received opinion as to the pathological nature of stricture; although it has been asserted by some, that false membrane deposited from inflammation upon the mucus coat, a sort of croupy or diphtheretic formation, is the material which thickens and blocks up the canal. Of this we have no reliable assurance, that such is ever the case; the negative opinion is fully corroborated by the researches of Alphonse Guérin, of Paris, who, with reference to this point, examined one hundred diseased urethras in the dead houses of that city—fifty of which number had strictures—and, to use his own language, "I have never seen the slightest trace of granulating tissue upon the surface of the mucus membrane, or in the spongy tissue of the canal." Further, he says, "In none of the numerous cases which I have examined, have I found any false membrane on the free surface of the mucus membrane." Assuming such to be the true pathological nature of the disease, what must be the treatment? Will stretching or extension, dilatation, or absorption destroy this tissue? Do we resort to stretching machines or extension apparatus to relieve and cure the cicatrices or coarctations incident to wounds or burns? or do we have recourse to the more rational method of severing the bands? Were we permitted to reason from analogy, we should most unhesitatingly decide upon the latter.

It will not be necessary to go into a close anatomical description of the urethra, but an outline, simply of its form and proportions, will be necessary to illustrate our subject. Its physiological action and the causes producing stricture are irrelevant to the operation, and hence I shall pass them altogether.

The urethra—the canal from the bladder, through which the urine is passed, and the semen ejected—is a tube of some $8\frac{1}{2}$ to 9 inches in length, lined with a tender mucus membrane, into which the orifices of the prostatic sinuses, the ducts of the seminal vesicles, the ducts of Cowper's glands, and the openings of the mucus follicles behind some 80 to 90 lacunæ or sacks, enter. This mucus membrane overlies a basement tissue, or sub-mucus layer, around which muscular fibres are interlaced, making it a

muco-fibrous tube, surrounded with the muscular and erectile tissue of the corpus spongiosum. It is abundantly supplied with blood vessels, and more especially nourished at the bulba region, by the two arteries which supply the bulb; they enter just behind Cowper's glands, on either side, leaving a space between them of a line to a line and a half, into which, as a space of selection, incisions are made in operations near the bulb, whether they be internal or external sections. The measurements of length and breadth of the canal differ in individuals, scarcely two urethræ agreeing exactly as to dimensions.

In looking over a table of lengths, I find the extreme to be 9, the shortest $7\frac{1}{4}$ inches, but the deviation from each other in the average was not more than $\frac{3}{4}$ to $\frac{1}{4}$ of an inch; that is, from $8\frac{1}{4}$ to $8\frac{5}{8}$ inches, which gives us an average urethra, one $8\frac{1}{2}$ inches in length; this we will divide into its anatomical parts, and show three principal divisions.

The First, or Spongy Portion, is the pendulous part of the penis, which extends from the bulb, and which averages $6\frac{1}{2}$ inches.

The Second, or Membranous, extends from the bulb to the prostate, lying between the pelvis and the perineum; it is $\frac{3}{4}$ of an inch in length.

The Third, or Prostatic, extends from the termination of the membranous to the bladder, being entirely within the pelvis, posterior to the triangular ligament, and is $1\frac{1}{4}$ inches, thus giving, when taken collectively, $6\frac{1}{2}$, $\frac{3}{4}$ and $1\frac{1}{4}$ equals $8\frac{1}{2}$ inches, the total length.

Now, for convenience of description, the urethra must be divided into *Regions*, wherein we generally find strictures located.

The First Region is at the sub-pubic curvature, or that portion of the canal immediately in the vicinity of the junction of the spongy, with the membranous parts, being 1 inch in front of, and $\frac{3}{4}$ of an inch behind the junction, thus including the entire membranous portion with one inch in front, which gives the first region a length of $1\frac{3}{4}$ inches.

The Second Region extends from the anterior limit of the first region to within $2\frac{1}{2}$ inches of the external meatus of the urethra, consequently being in length from $2\frac{1}{2}$ to 3 inches.

The Third Region is from the anterior extremity of the second to the meatus externus, being a space of $2\frac{1}{2}$ inches, and embracing the fossa navicularis. It will be observed that the prostate is not included in these three regions, and for the reason--there is no authentic case on record, if we accept the two, one mentioned by Ricard, and the other by Leroy, in which a stricture has ever been found in the prostate. Now, the locality in these regions, or the particular region, where we most generally find strictures, will be interesting, as it gives us some guide in forming our opinions as to the nature of the coarctation, and is also

lutely necessary when we come to treat the disease. I know of no better plan to furnish this information, than to give a sort of synopsis of the observations of the most prominent writers on this point.

John Hunter, locates strictures more frequently just in front of the bulb, or in the first region, 6 inches down the urethra. Sir Everard Home, in his observation, has found it $6\frac{1}{2}$ to 7 inches down the canal, most usually just below the bulb: next in frequency $4\frac{1}{2}$ inches from the meatus.

Sir Benjamin Brodie rarely ever saw it at any other place than just behind the bulb.

Mr. Liston generally found it in the second region, 2 inches from the meatus externus.

Mr. Shaw, who made 100 dissections of persons dead with stricture, never saw it posterior to the bulb.

Sir Charles Bell sustains this statement with the result of his experience.

Benjamin Phillips, in 173 examinations, noted the large average of strictures, to be located $5\frac{1}{2}$, and none below $7\frac{1}{2}$, inches down the canal; his statement shows the bulba or first region to be the most usual site.

Civiale, than whom no better or more accurate authority on this subject has ever lived, says the most frequent location is in the following order: First—At the external orifice. Secondly—One of the two extremities of the fossa navicularis. Thirdly—The anterior region of the spongy portion. Fourthly—The junction of the bulba and membranous divisions.

Amussat found it more frequently at the junction of the bulba and membranous portions; and Vidal de Cassis concurs with him in opinion that this is the locality selected by the disease.

Ducamp said 5 out of every 6 cases will be found at 4 inches 9 lines, to 5 inches 3 lines from the meatus; whilst Leroy insists that 19-20 exists at the bulb.

Sir Henry Thompson has more recently given an abstract analysis of 270 cases of stricture, in the urethræ of which patients, 320 distinct coarctations existed; by close examination, he found 17 per cent. of all these contractions were near the meatus, or just about the fossa.

Prof. Gouley, of New York, states that his experience is that 30 per cent. of all the cases which he has seen, were within the region just about the meatus. Although I have seen many coarctations near the external extremity of the canal, still, my own observation on firm strictures, shows a greater number just in front of the bulb, than at any other locality.—In the treatment of strictures—failing in dilatation, aided by caustics, and receiving no benefit from divulsion, especially in those cases located in the pendulous portion of the urethra—we have no recourse

left us but to resort either to external or internal urethrotomy. As it is not our purpose to refer to external operations, I will pass them by, and describe the latter, which is performed by two procedures; first, by an incision from before backwards, or in the axis of the urethra, from the meatus toward the bladder; second, by scarifications or incisions from the vesicle side of the stricture toward the meatus. The first by incisions made upon a conductor; the second by incisions made without a guide. In the first procedure, should the mouth of the stricture be so closed as not to permit the instrument or its guide-rod to pass, we will be forced to operate without a conductor, simply by passing a lancetted urethrotome down to the face of the coarctation, and pushing forward the blade, endeavor to follow the urethra in its anatomical axis. This was the operation of Physic and Stafford, and of surgeons who followed in their path; but it matters not how accurate the knowledge of anatomy, or dexterous the touch of the surgeon may be, we have no certainty this operation can prove a safe or reliable one, for the least deviation from the course of the urethra must result in opening the wall of the canal, and either a consequent hemorrhage, or urinal infiltration follow. Such an operation I consider extremely hazardous, and for myself would greatly prefer to cut down upon the site of the stricture, and make the operation of external urethrotomy, as one infinitely safer; but where the operation can be done upon or with a guide, it becomes, in the hands of a dexterous operator, almost an absolutely safe and sure operation; all which is required being to dilate the contraction sufficiently large to admit the conducting bougie, or the fixed beak of the urethrotome, and follow this up with the blade of the same; thus completing in a moment and safely an operation otherwise performed, a most dangerous one. Assuming, then, the operation to be performed with or upon a guide, it will be well, in a few words, to describe the same. The essential part of this operation is to pass a small conducting rod or bougie into the urethra, through the stricture, and on into the bladder; upon this as a guide, the blade is made to follow. Of these instruments Civiale used a cutting blade, to which was attached a directing probe, which was concealed in a canula, the end being pushed into the contraction, by gentle pressure and motion, it passes through the stricture, the blade follows and incises the contraction. Following him, Reybard had his urethrotome, which was to be used *d'avant en arrière*, or from before backwards; it was a complex arrangement of canules, following a short gum bougie as a conductor, and with a blade which cut laterally into the urethra; a complicated union of dilators, guide-rods, blades, &c., which did not give general satisfaction, and soon fell into disuse.

Bonnet, of Lyons, introduced a modification of this instru-

ment, which consists of a soft silver bougie, with a probe point, which can be passed through the stricture, and give conduct to a blade like that of Reybard. These instruments all served a very good purpose for the pendulous portion of the urethra, but would not answer for the curved. Ricord, Leroy, and Amussat, with a host of others, invented and brought into use their special instruments, against all of which, more or less objection obtains.

More recently another instrument has been brought before the profession by a surgeon of eminence in France, M. Maisonneuve, which, in its modified form, is probably the best ever devised. It consists of a No. 1 deeply grooved sound, about twelve inches in length, with a ring near the distal extremity for a handle; to the vesicle end, is screwed a very fine filiform conducting bougie; a triangular blade attached to a stem somewhat longer than the sound; the apex of the triangle is blunted so as to prevent injury to the sound mucus membrane, with two slots at the edge of the base of the blade, which serve to confine it in the groove of the sound when in use.

The steps of the operation are extremely simple. The bougie is passed through the stricture, and its distal end screwed to the vesicle end of the sound; the sound is now pushed through the stricture squarely, and the bougie coiled up in the bladder; the blade being entered into the groove, it is pushed through the contraction at one sweep, and the instrument gently removed from the canal. These are the points of the operation, but there are objections, both to the instrument and the operation; the sound mucus membrane may be injured in its entire length; then there is no certainty that the small bougie has passed the stricture and become coiled up in the bladder; it may have entered a false route, and traveled along in the tissue by the side of the bladder or rectum; being little larger than a thread, it may have bent upon itself against the stricture, and become coiled in the urethra, or even return by the side of the staff to the meatus, and be cut by the passage of the blade. Such an accident has more than once happened. To obviate these objections, M. Voillière has added a blunt blade, which glides along with the knife until the face of the stricture is reached, and then being retracted, the blade is pushed through the contraction, (fig. 1).

This offers no particular advantage, and seems only to complicate matters, as the chief objection is the difficulty of getting the bougie through a long, tortuous contraction. He has rather complicated the apparatus, and made it more difficult to use.

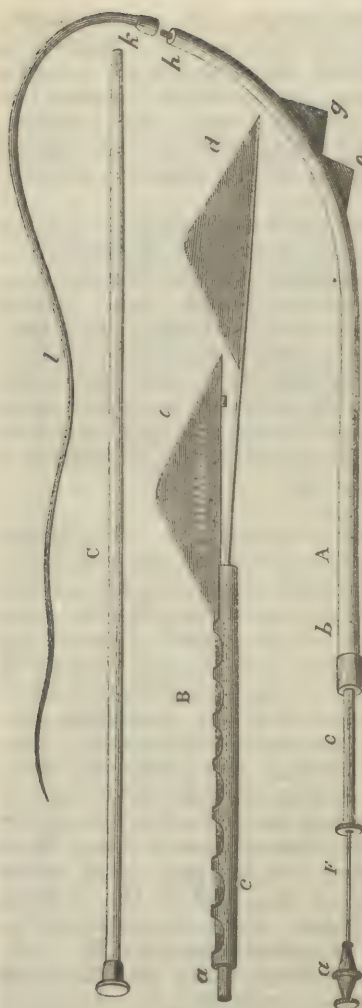


Fig. 1

The retrograde operation, or the one from the vesicle edge of the stricture forward, is generally had recourse to after the stricture has been sufficiently dilated to admit the oval end or ball of Civiale's instrument, (fig. 2) which is passed half an inch beyond the stricture. the blades sprung, and as it is drawn out, cuts the stricture from behind forward. Civiale's rule was to cut half an inch on either side of the coarctation, so as to insure the cutting of all fibres or bands which possibly might extend beyond the free edges of the stricture.

Other instruments combining both methods, have been devised, so that without removing the urethrotome, after the incision has been made from before backwards, the blade can be sprung and the instrument converted into a retrograde urethrotome. Such an instrument, and a most valuable one it is, has been invented by the ingenious Charrière, (fig. 3) which has had the further improvement added of the conducting bougie of Maisonneuve. Or the simple contrivance of M. Trelat, (fig. 4) which performs all the sections, both anterior and posterior, simply by reversed movements of the blade-rod, will be



Fig. 3

found a most useful addenda to the armamentarium of the urethrotomist.

With the hope that gentle scarifications over the stricture in the line of its edges, would hasten absorption, and consequently that the use of the bougie would complete the cure by dilatation, Amussat, Dzondi, Ricord, Begin and Roberts suggested and had made, numberless scarificators to cut small incisions into the

stricture, so as to get up suppuration sufficient to remove the coarctation. Failing in this purpose, the operation has fallen into disuse, and is no longer accounted among the operations for the cure of stricture. Going from one extreme to another, Dr. James Arnott proposed as an operation "excision" or "resection" of the stricture, in which he would advise, with an instrument on the order of a trephine, that the stricture should be rasped or cut out. The idea was accepted and advocated by Mr. Benj. Phillips and Leroy d'Etiolles, but it has fallen into its merited oblivion. We now come to the last of the retrograde

operations—that of M. Reybard. He started out with the belief that strictures could not be relieved or cured by dilatation. He regarded the use of bougies or sounds as only subservient to the operation by the knife. His operation can be described in a few words, and consisted in dilating the urethra until it would receive an instrument of No. 9 or 10 English measure. This being accomplished, he passes his urethrotome, which, by an ingenious mechanism, is so constructed that two blades separate and stretch the mucus membrane forcibly, and between them a long blade passes and cuts the entire stricture, with at least an inch on either side—deeply, almost through the canal itself; and instances are recorded in which the operation was as extensive as an external incision, the blade actually appearing through the integuments.

The after treatment consists in the retained sound, and then the passage of a dilating instrument, for thirty or forty days, at least twice each day, so that the wound is prevented from cicatrising, and to permit, or force the same, to heal by granulations, thus insuring a long "intermediate cicatrix," or "splice" to fill up the wound, and thus, by this piece let into the side of the canal, permanently enlarge the same. The operation was



Fig. 3

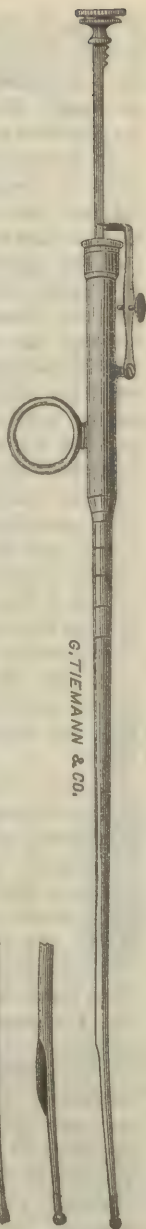


Fig. 4

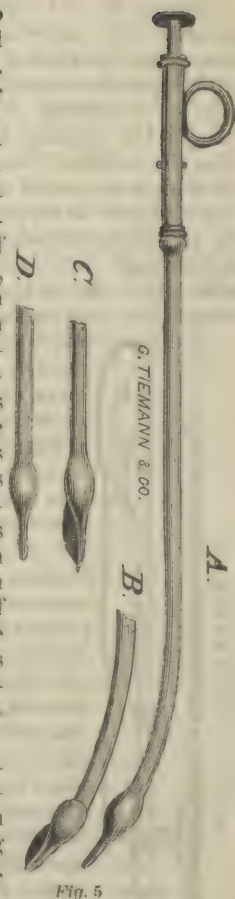
a frightful one, yet he reports successes to a remarkable degree. It has not received the universal sanction of the profession, although the commission awarded him the Argentiuel prize of 12,000 francs.

In America, where this operation is beginning to become a favorite method of interference for stricture, many valuable instruments have been devised and admitted into very general use among the surgeons of our large cities. That of Dr. S. D. Gross, (fig. 5.) whose name stands deservedly high among the most distinguished surgeons in this department of the profession, is constructed after the plan of the old Stafford instrument, with the difference that the blade is guided by a short beak, which enters the mouth of the stricture, and serves to guide its course. In the hands of a surgeon like its distinguished inventor it is an useful instrument, but with one not so dexterous, the sides of the canal may be opened. An objection which I find to the direction of the incision is, the blade passes on the concave, instead of the convex side, and consequently cuts the stricture in its upper segment, when it is more advisable, for reasons given, to direct our incisions against the floor of the urethra.

Prof. Bumstead, of New York, has recently introduced a modification of the instrument of Maisonneuve. It is shorter in its curve, and provided with a conducting bougie, like the original; it is, a good one, and, with the exception mentioned, essentially the same as the French instrument, (fig. 6.)

Prof. Pancost, of Philadelphia, and Westmoreland, of Atlanta, Ga., have brought into use, each his own instrument. That of Dr. Pancost I should think was more difficult to use, and better adapted to strictures located far down the canal, (fig. 7).

Westmoreland's (fig. 8.) is so constructed that when it is introduced closed, the end of the canula, C, comes down against the stricture, and the small steel rod A, is passed through the opening in the contraction, when, by a movement of the stop D, the blade B, is protruded and conducted along the guide-rod, through the stricture. It is rather an ingenious and good instrument.



Dr. Peters, of New York, uses an instrument (fig. 9) of his invention, which consists of a staff with a groove in which glides a blade, concealed in the entire length of the sound, until near the end, where a wedge in the groove elevates the blade, when it reaches

that point. The objection to the instrument appears to be, that an exact knowledge of the precise locality of the stricture must be had, so that the place on the staff where the blade is to be elevated, must be exactly opposite to the spot we desire to incise. The staff is closely graduated along its sides, yet in the hands of one not accustomed to the use of an urethrotome, I should fancy some difficulty would be experienced.

Prof. Gouley, of New York, who has given much attention to urethral surgery, and is an advocate of this operation in selected cases, has modified the principle of a French instrument, which may not inappropriately be called a *bladed sound*, as it consists of a steel sound with a short curve, upon the convex side of which a stationary blade is placed, with a cutting edge directed toward the point of the sound, (fig. 10).

Dr. Gouley has added the valuable improvement of canulating the sound, and using as a guide his filiform whalebone bougies, which are passed, after his pecu-

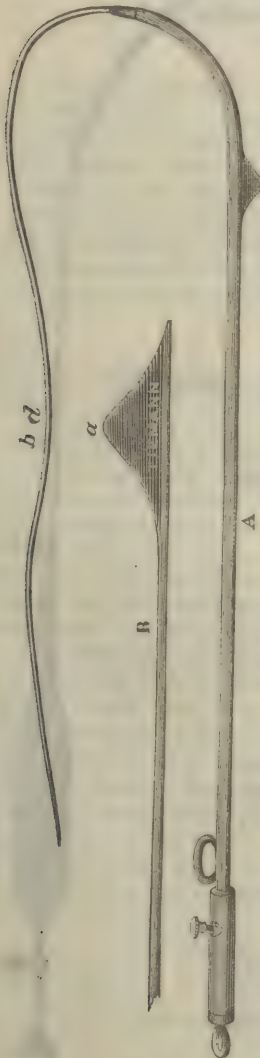


Fig. 6.

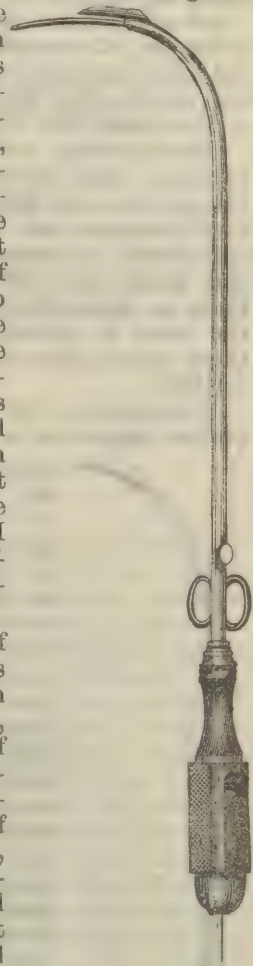


Fig. 7

liar method, through the stricture, and the sound glided over them, (fig. 11.)

An additional improvement of his, (fig. 12) consists in placing upon the sound a protecting shield, after the manner of Voillimere, (fig. 1.)

Besides these, many other surgeons have invented and brought into use their special urethrotomes, but it would only serve to consume time and space by a reference to them, as they are essentially the same in principle with those which have been described.

But probably the most important operation is the sim-

plest of them all. I allude to opening up the retrocessments at the orifice of the urethra. Strictures located here yield to no treatment save that of incision. We can neither call it internal nor external urethrotomy, for it partakes of the characters of both, being external, even though it should extend to the lower limit of the fossa navicularis.

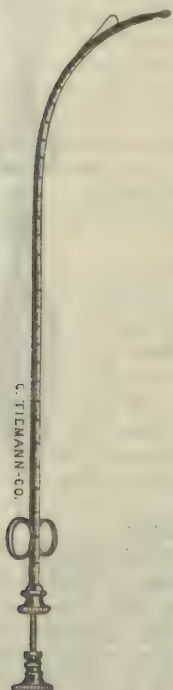


Fig. 9.

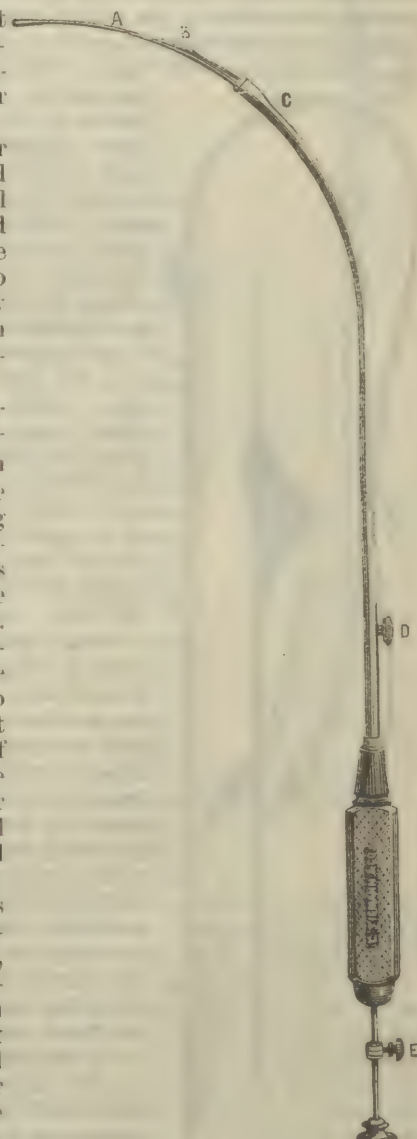


Fig 8.

It is easily performed with a probe-pointed bistoury, or more easily with the instrument devised by Civiale for that purpose, his "*Urethrotome à Bascule*," or "*Meatatome*," (fig. 13.)



Fig. 13.

He first proposed this debridement for the purpose of enlarging the mouth of the urethra, preparatory to the passage of his lithotrite in operations for stone. Since the subject of urethral surgery has claimed more generally the attention of the profession, we see the importance of this little operation, and how easily and readily some of the most obscure affections yield after the section of the meatus.

Two cases which have recently been under my care, may prove not uninteresting as illustrative of this fact.



Fig. 10.

The first was a gentleman from the interior of the State, *æt.* 35, who had been suffering a long time, over 18 months, from a troublesome urethral discharge, which had obstinately resisted all treatment, save the only one, which could possibly have relieved him. He came to Mobile for the purpose of being treated for what had been pronounced "an old chronic gonorrhœa," and being on the eve of his nuptials, to use his own classic expression, was "in no good way for anything of that sort." Suspecting a stricture at the sub-pubic curvature, I essayed to examine his urethra, although he positively assured me he could pass a large stream, and that nothing of that nature was the matter. To my astonishment I was unable to pass the smallest size filiform bougie; the meatus was closed, and the entire fossa navicularis the seat of an active urethritis. I opened the mouth freely with the meatatome, plugged it with a wax bougie, which he wore for some twelve hours, and then treated him with a mild astringent injection, which he used morning and night. At the expiration of a week he returned home perfectly well.



Fig. 11.

The other was a gentleman of this city, who, two summers ago, had been spending the season at Newport. Whilst enjoying the surf bath of that delightful resort, was stung upon the penis by a sea-nettle, (*Medusa Equorea*). The pain was severe, and the consequent irritation and inflammation very great; the integuments enormously distended and œdematous, rendering it necessary for him to remain in his room, confined to bed, for several days. Upon its subsidence he returned home, where, during the past winter, spring, and summer, he enjoyed his accustomed health, noticing nothing unusual in his condition. Some three months past, his attention was attracted to the fact that he was losing, as he expressed it, "his manhood"—in a word, he was impotent. Terrified and alarmed at this condition of affairs, infinitely worse than the sting of all the sea-nettles which swim in the Atlantic ocean, he sought me for consolation. Upon examination, I discovered the meatus in a great measure closed by a dense cicatrix, the result of the inflammation and ulceration produced by the nettle. The treatment was apparent. I opened the urethra large enough to admit a No. 40 Béniqué Sound, treated it with a retained plug, and followed up the treatment with the occasional introduction of a sound through the entire length of the urethra—one of the best methods of allaying urethral irritation; and was thus enabled, in less than ten days, to restore my patient, not only to health, but to his domestic happiness.

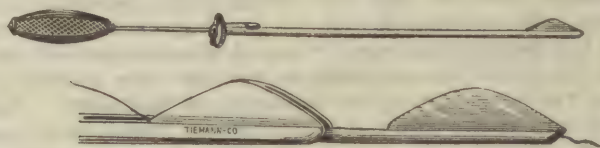
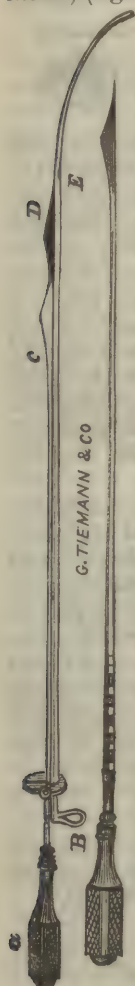


Fig 12.

This operation is, under all circumstances, especially required in those strictures located deep in the canal, which we wish to dilate to a full degree, and which we would find it impossible to accomplish unless the meatus was first incised; and for obvious reasons, being the smallest portion of the tube, a full size sound could not be introduced, unless the meatus had first been opened.

The objections which I mentioned as pertaining to Maison-neuve and Voillimere's instruments, induced me to have constructed an urethrotome which, in my hands, has proved satisfactory; so far it has answered my most sanguine expectations, and I believe it will prove a valuable modification, particularly in those cases where the stricture is located at, or just in front of the bulb. Those located in the pendulous portion, can be easily operated on with almost any instrument, and as the most

simple, the probe-pointed knife and grooved director of Sir James Ferguson, of London, is especially adapted to them. But at the bulb and curved portion of the urethra, a regular instrument is more desirable; and with this end in view, I have combined the 'small, probe-pointed silver catheter' of Sir Henry Thompson, with the triangular blade of Maisonneuve, *guarded by a fixed shield*, (fig. 14).



Thompson's catheter is as follows, a small No. 1 English scale, at the point, which gradually increases in size to a No. 2 at the distal extremity. The eye E, of the catheter, is on the concave side, and is $2\frac{1}{2}$ inches from the end of the probe, which is *less* in size than a No. 1 bougie; and being small, smooth, and rather firm, although flexible, can be passed by careful manipulation through almost any stricture. My shield is fixed upon the convex side of the catheter, and just 2 inches from the eye of the instrument, which is on the concave side. Now supposing a stricture just in front of the bulb, the most usual place; it is $6\frac{1}{2}$ inches from the meatus; and as the wedge point of the shield C, is just 2 inches from the eye of the catheter, we can at once see when the small silver probe has been gently insinuated through the stricture, and on into the bladder, that with the addition of the two inches between the eye and the shield, when the shield comes down fairly and squarely against the stricture, that the two inches of the catheter from the shield to the eye, must occupy the space made up by the three-fourths of an inch in the membranous portion, and the $1\frac{1}{4}$ inches of the prostate, which gives the 2 inches, which, added to the $6\frac{1}{2}$ inches of the pendulous point, makes up the total length of the urethra to $8\frac{1}{2}$ inches; and we know the eye E, of the catheter is within the visicle cavity. Now, by withdrawing the catheter rod B, which works like a piston to a syringe, and we have a drop of urine follow, which clearly shows the instrument is within the bladder. We have now only to push on the blade-rod A, which is graduated along the stem, and the blade D, is directed along the groove through the coarctation, the stricture cut, and the instrument removed.

Fig. 14

ILLUSTRATION OF MY PROCEEDING.

Better to illustrate the method which has given the most satisfaction to me, I will suppose a case in which, by exploration with a '*bougie à boulé*,' or ball-pointed bougie, (fig. 15),



Fig. 15

we find, for convenience, a firm stricture, just in front of the bulb—I here speak of a firm stricture—such as will require the section by the urethrotome. We then select a small bougie, less than the size of the stream of urine which he is able to pass, and gently introducing it through the stricture, gradually in the course of three or four days, by increasing the size of the bougie, we open the coarctation large enough to admit the small probe of the "catheter urethrotome," and passing this on into the bladder, the shield reaches the anterior face of the stricture; and having satisfied ourself that the point of the catheter is within the bladder, which will be proved by a drop of urine appearing after the withdrawal of the mandrin, and that it is not in a false passage, we have only to turn the stop screw, push on the blade, and the stricture is cut.

It will now be necessary to examine and see whether a fold of membrane at the posterior edge of the stricture has not been left, which we tell by the introduction of the '*bougie à boulé*,' and gently withdrawing it; if it is caught on the edge of the ball, we select a No. 1 retrograde urethrotome of Civiale, (fig. 2) and pass it about half an inch beyond the posterior edge of the stricture, the blade being sprung, and an incision made through the undivided parts, and in a line with the incision made by the urethrotome, from before backwards, until it has reached a point from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch beyond the anterior edge of the stricture. This section will admit, in an ordinary sized urethra, about a No. 40 Béniqué Sound, (fig. 16,) which is equal in size to a No. 20 of the ordinary French scale, or a No. 11 of the English gauge. This being gently passed, we gradually increase the size up to a No. 44 or 46, which equals a No. 12 to 13 English catheter. This is as full as, under ordinary circumstances, one would desire to carry distension.

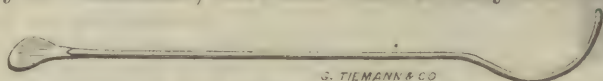


Fig. 16.

We now pass a No. 12 English gum catheter, draw off the urine, and leave it as a retained sound for 24 hours; longer than

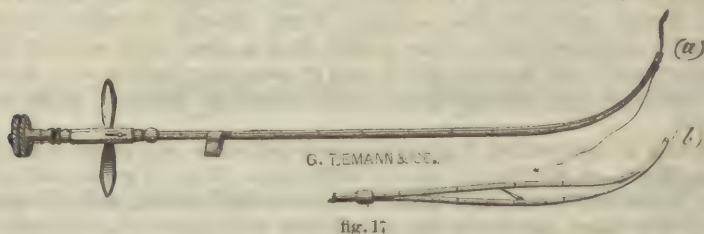
this I do not deem it necessary—it serves to prevent the urine coming in contact with the incision, and permits it to glaze over with lymph and become seared. Care should be taken not to plug the catheter—the urine must find a free vent, so that the bladder shall not become filled, and in escaping find its way along the sides of the catheter, and thus come in contact with the wound.

After an operation, I always give a full dose of opium, usually 40 to 50 gtt. of McMunn's elixir, with some 15 to 20 grains of quinine, a hot hip bath, and absolute rest in bed which will, in nine out of ten cases, preclude the possibility of a rigor or an attack of urethral fever. The catheter is removed at the expiration of 18 to 24 hours, and on the second or third day I begin with a Béniqué Sound, equal in size to the then present calibre of the urethra, and increase it by two or three numbers each day, or every other day, until the maximum point of dilatation possible, in the especial urethra under consideration has been reached, remembering the fact, *each urethra has its own particular size* and they vary greatly as to capacity; so that where No. 45 has been reached in one, No. 60 would be required for another. Each day, upon the introduction of the sound, it will be well to drop back one or two sizes, from the point reached at the last day, so as to avoid any useless stretching. In this manner we gradually dilate the urethra, so that we reach the point which we desire in some eight to ten days; and it is a matter of importance to incise freely the meatus with the meatatome, (fig. 13,) so that a full sized sound can reach the strictured point, which, cannot be attained unless by this incision, as the anatomical condition of the urethra is such that the meatus is always less in size than the main canal. It is best to make one operation of the whole, and do both the deep urethral section and the debridement of the meatus at the same time. It is rarely ever necessary to go beyond No. 54 of the Béniqué scale, which equals a No. 16 of the English measure.* During the course of dilatation it will be well to fortify the patient with small doses of quinine and iron, say from 3 to 4 grains of the former, with 10 to 15 gtt. of the tincture of iron, three or four times each day; with rest and quiet after each introduction of the distending bougie, and occasionally a hot hip bath as an adjuvant, will ward off a rigor, prevent an attack of urethral fever, and hasten the cure.

It should be borne in mind hip baths are serviceable only when they are taken just after the use of the instrument, and for a few minutes, not longer than five or ten minutes must the patient remain in; beyond this they congest the pelvic viscera, and

*In some cases I have resorted to dilatation with Thompson's dilator, after an operation with the urethrotome, but I am not partial to it, as I think it better to harden up the cicatrix by gradual dilatation. (fig. 17.)

do harm rather than good. After the wound in the urethra has fully healed, I furnish the patient with a steel sound, suited to the



calibre of his urethra, that is, in size corresponding to the natural size of his canal, which, of course, is less than the point to which dilatation has been carried.

He is instructed to pass this for a month, three or four times each week, gradually increasing the interval of time, until he uses it once each week, or twice each month. This I do as a precaution against the possibility of a closure of the stricture taking place, for I am free to confess it will again close up in ninety-nine cases out of every one hundred, unless this course is adopted, and I hazard the assertion, without fear of contradiction, that there is no course known to the profession by which a stricture can be cured against all possibility of a relapse, and that the only hope we have is to use the bougie after the manner described; by this procedure we can keep a patient at a standpoint, from which he will not probably fall back; and by the operation we place him in a position to enjoy life, and with the exception of the little trouble caused by the weekly or monthly introduction of the sound, he knows no difference in his situation, from perfect health. The instruments with which I instruct the patient to supply himself, are steel sounds, plated with silver, having the double curve of Béniqué, and graduated in size from the point to the shank—the shank being two sizes larger than the point. The introduction of this sound becomes very easy for the patient, and it is surprising to see with what dexterity they acquire its use. I have now a patient, recently operated upon for two bad strictures, who was unfortunate in the late war, and lost his right arm; yet, notwithstanding this, he experiences not the least difficulty in introducing his bougie.—In all the operations with urethrotomes of various kinds, which I have performed upon strictures, now over seventy in number, I have never had any trouble of consequence. In one case only have I had any urinal infiltration, and that was a patient with two firm, hard strictures, located, one near the meatus, the other near the middle of the pendulous portion, or in the second region. In passing the blade of the retrograde urethrotome through the stricture, it passed in one

spot through the urethra, and at night *he plugged* his catheter, which caused the urine to pass by the side of the sound, and finding its way through the little cut, a small tumor formed under the integument; the infiltration was very much circumscribed; gentle pressure, with a large open catheter in the urethra, and a moderately firm bandage overcome all difficulties, and in four days not a vestige remained; the catheter was removed, and he passed his urine *per vias naturales*—went through the course of dilatation, and was discharged cured.

In no case have I had any urethral fever, and in a few cases only, a decided rigor, after an operation. Indeed, in my experience, it has been more generally observed that rigors follow exploratory investigations before, oftener than after operations. . And now upon the subject of hemorrhage! So far, my experience has been most satisfactory upon this point. In one case, from a very slight scarification I had, for a few minutes, a most frightful hemorrhage, which caused my patient and myself much uneasiness, but by gentle pressure and the application of ice to the perinaeum, it soon ceased, and gave me no more trouble. He was a gentleman of this city, who had been suffering from stricture for over forty years. As usual in these cases, he had been the victim of both regular and irregular practice; bougies, caustics, and forced catheterism had, on frequent occasions, been resorted to, to relieve him of retention; when he fell into my hands; I found him a wreck—a constitution broken down, and a shattered nervous energy, the result of the absorption of urea. His rest was disturbed by frequent calls to micturate, and he the victim of all the horrors of confirmed stricture, a condition of affairs which renders death preferable to life. Upon examination—having tried every method to gain admission into the bladder, with one finger in the rectum, I found that a firm, tight impassable stricture existed in the first region, and extended from about half an inch in front of the bulb, near to the prostate; a false passage existed, the result of forced catheterism, which extended from the face of the stricture along by the side of the membranous urethra, and emptied into the rectum; in fact, I entered a small bougie into the urethra, and drew it out, through the rectum. He passed his urine only by drops, and as the passage was a long tortuous one, and I am unable to effect an entrance with an instrument, I determined to try and open the mouth of the stricture; with this end in view, introduced a scarificator of Ricord, hoping I could just nick, as it were, the space between the mouth of the stricture and the laceration, where the false route left the urethra; with a very slight cut, which I made directly downward, and with all due regard for the position of the bulba arteries, I am convinced I opened one or the other of them, for instantly I encountered a frightful gush of

blood, which sorely tried all the calmness and dexterity I possessed to staunch it! As to the cause, I have but one solution to offer, which is, by the previous interference with instruments in the hands of some one not skilled in their use, the artery must have been pushed aside from its proper locality, and kept so by the deposit of plastic material. Seeing that internal urethrotomy could effect nothing in this case, I determined that I would perform an external section, so soon as he should sufficiently recover as to be able to submit to the operation. Being unable to pass anything through the stricture, I was prevented from resorting to the operation of Mr. Syme upon his guide staff, and as a consequence, nothing remained but for me to adopt the old operation, "*la boutonniere*;" having passed a full-sized lithotomy staff down to the face of the stricture, I opened the urethra in front of the contraction, upon the point of the staff; I was thus enabled to pass through the opening made a small grooved probe, which I gradually worked through the stricture on into the bladder, and upon this I glided in a narrow tenotome, and incised the stricture; the staff now passed to the bladder, but it could not be made to enter, kept out by the 'bar-like ridge,' (so described by Civiale and Gross,) which completely blocked up the entrance; however, with a long probe-pointed bistoury, I freely incised the 'bar' and passed a No. 12 instrument into the bladder, which was almost filled with fetid urine; the catheter was retained twenty four hours, and then removed. On the second day after the operation, gradual dilatation with the sound of Bénéqué was commenced; on the fourth day the external incision was found to be entirely healed, and the Carlesbad suture pins with which the wound had been closed on the day of the operation, removed; the morning of the seventh day found him walking about the city engaged in his usual avocations. He is now perfectly well, and with the exception of having to pass a No. 52 Benique Sound (equal to No. 15 of our scale,) every Sunday morning, which time he will gradually extend to once each month, he experiences no annoyance. Since the month of May, 1869, he has not had the least inconvenience, his general health perfectly restored, and only the memory of his past troubles remains.

One other case of hemorrhage, and the only one which has fallen under my notice, was in an old gentleman of this city, whose stricture was an inflammatory one, and which experimentally I had attempted to destroy by Whatley's method, with caustic potash—the slough separated, and an alarming hemorrhage ensued, partly filling his bladder with a clot; it was easily controlled by forcing in a large catheter, and using external pressure. The greatest trouble was caused in removing the clot, which was accomplished in a few days by breaking it up with a staff, and washing out the bladder with chlorine solutions. He leads

comparatively a comfortable life; but I do not consider him cured, and believe he will eventually seek relief from the use of the urethrotome. With these two exceptions, in a large experience, I have never seen a hemorrhage exceed a table-spoonful follow any one of my operations; and it must be noticed that in one of these cases referred to, it was not the result of an incision, but the sequence of a cauterization.

The next difficulty is urethral fever; my experience has satisfied me that moderate doses of iron and quinine, with the hot hip bath, will usually ward this off. I am convinced we have more to fear on this score from the shock produced by exploratory examinations with small instruments, than from the operation of urethrotomy.

Pyemia, which has been spoken of as a concomitant, I have never encountered, and believe, with judicious management, it should not appear as a sequence.

Infiltration of urine should not necessarily occur, and it depends upon the surgeon himself whether or not he shall be troubled with it, a large *open* retained catheter, I believe, will, in ninety-nine out of every one hundred cases, prevent it.

These are the principal points of objection to this operation; but where the surgeon is governed by the Golden Rule, "*arte non vi*," in all operations about the urethra, I am satisfied no untoward symptoms will arise to mar his most sanguine expectations.

In an appreciation of the different methods of cure, Internal Urethrotomy will bear a rigid examination, resulting in its favor, if the statistics are carefully gathered. Its advantages are, that above all other operations, it can be done quickly; no anæsthetic is required, and we accomplish more in a few minutes than could have been done by dilatation or cauterization in as many days or weeks. The incision, when properly made, is clean, smooth, and harmless, becoming speedily sealed over with lymph, and with less danger of infiltration or suppuration than in the operation by divulsion.

The separation of the slough, after cauterization, gives more danger of hemorrhage; and the shock which produces urethral fever is less, after a carefully performed internal section than any other known operation.

Internal section is especially indicated in all cases of stricture, in the pendulous portion of the urethra, and especially in those cases, located in or near the glans penis; here, from the nature of the structure, we know they are particularly rebellious to dilatation, and even after free incision, prone to return. No other operation has furnished more satisfactory results; *Dilatation*, *Divulsion* and *Cauterization*, each leave the urethra with a tendency sooner or later to recontract and narrow down its calibre; so that none of them are entirely free of objections. Hence we con-

sider it at least the part of sound judgment to select "Internal Urethrotomy" as the one which, upon rational grounds, offers the best chance of success. Although there is no operation for stricture more difficult to perform neatly and completely than this—none which requires more knowledge of the urethra, more skill in the use of the instrument, or tact in the management of the case. Still, there is none which will give more satisfactory results, or which is more apparent to the sufferer who seeks relief. With these views we recommend and adopt it, as the operation which, in the hands of a judicious surgeon, will furnish *Sécurité, Simplicité, Célérité*.

ADDENDUM.—In some cases in which I have been unable to pass a guide-rod through the stricture, or in cases complicated with enlargement of the third lobe of the prostate, I have found this instrument, (fig. 18) particularly well adapted, (an invention of my own,) which is nothing more or less than a silver catheter with a short curve, flattened on its sides near the point, with a beak, to guide a blade which is concealed in the catheter—the edge of the blade is directed downward, and when pushed through a stricture, or upon the lobe of the prostate, the incision is made; after which, by unscrewing the cap at the distal end of the catheter, the blade can be withdrawn, and the catheter remaining *in situ*, act as a 'sonde a demeure,' or retained catheter.



Fig. 18.

